Distributed by:

JAMECO® ELECTRONICS

www.Jameco.com ✦ 1-800-831-4242

The content and copyrights of the attached material are the property of its owner.

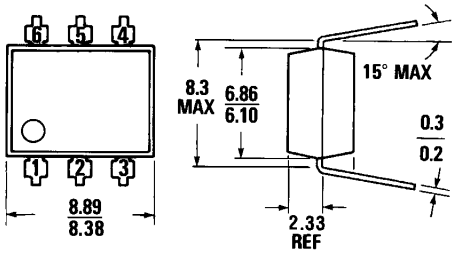
Jameco Part Number 172187

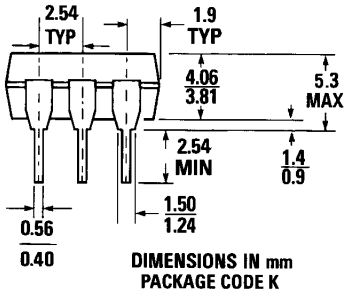
FAIRCHILD
SEMICONDUCTOR™

PHOTOTRANSISTOR OPTOCOUPLERS

H11A1 H11A2 H11A3
H11A4 H11A5

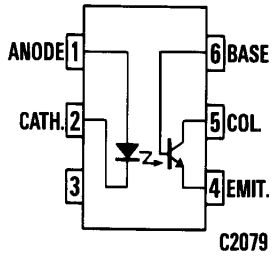
PACKAGE DIMENSIONS





DIMENSIONS IN mm
PACKAGE CODE K

ST1603A



Equivalent Circuit

DESCRIPTION

The H11A series consists of a gallium arsenide infrared emitting diode. coupled with a silicon phototransistor in a dual in-line package.

FEATURES

- Power supply regulators
- Digital logic inputs
- Microprocessor inputs
- Appliance sensor systems
- Industrial controls
- Underwriters Laboratory (UL) recognized—File #E90700

ABSOLUTE MAXIMUM RATINGS

TOTAL PACKAGE

Storage temperature ..... −55°C to 150°C
Operating temperature ..... −55°C to 100°C
Lead solder temperature ..... 260°C for 10 sec

INPUT DIODE

Power dissipation (25°C ambient) ..... 100 mW
Derate linearly (above 25°C ambient) ... 1.33 mW/°C
Continuous forward current ..... 60 mA
Peak forward current (1 μs pulse, 300pps) ..... 3 A
Reverse voltage ..... 3 V

DETECTOR

Power dissipation (at 25°C ambient) ..... 150 mW
Derate linearly (above 25°C) ..... 2.0 mW/°C
V_{CEO} ..... 30 V
V_{CBO} ..... 70 V
V_{ECO} ..... 7 V
Continuous collector current ..... 100 mA

ELECTRICAL CHARACTERISTICS (T_A= 25°C Unless Otherwise Specified)

INDIVIDUAL COMPONENT CHARACTERISTICS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward voltage	V_F		1.1	1.5	V	I_F=10 mA
Reverse leakage current	I_R			10	μA	V_R=3 V
Capacitance	C		50		pF	V=0 V, f=1 MHz
OUTPUT DETECTOR						
Breakdown voltage Collector to emitter	BV_{CEO}	30			V	I_C = 10 mA, I_F = 0
Breakdown voltage Collector to base	BV_{CBO}	70			V	I_C = 100 μA, I_F = 0
Breakdown voltage Emitter to Collector	BV_{ECO}	7			V	I_E = 100 μA, I_F = 0
Collector dark current	I_{CEO}		5	50	nA	V_{CE} = 10 V, I_F = 0
Capacitance	C		2		pF	V_{CE} = 10 V, f = 1 MHz

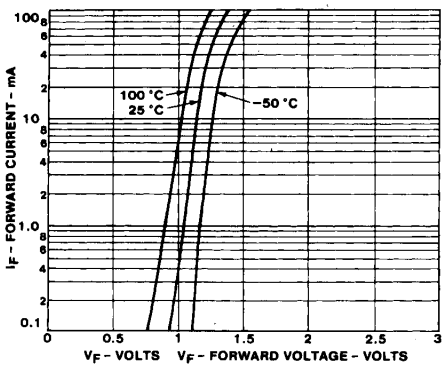
TRANSFER CHARACTERISTICS

CHARACTERISTIC		SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
DC current transfer ratio	(H11A1)	I_C	5.0			mA	I_F = 10 mA, V_{CE} = 10 V
	(H11A2)	I_C	2.0			mA	I_F = 10 mA, V_{CE} = 10 V
	(H11A3)	I_C	2.0			mA	I_F = 10 mA, V_{CE} = 10 V
	(H11A4)	I_C	1.0			mA	I_F = 10 mA, V_{CE} = 10 V
	(H11A5)	I_C	3.0			mA	I_F = 10 mA, V_{CE} = 10 V
Saturation voltage		$V_{CE(SAT)}$		0.1	0.4	V	I_F = 10 mA, I_C = 0.5 mA
Rise/fall time		$t_{r/f}$		2		μs	I_{CE} = 2 mA, V_{CE} = 10 V, R_L = 100Ω
Rise/fall time		$t_{r/f}$		300		ns	I_{CB} = 50 μA, V_{CB} = 10 V, R_L = 100Ω

ISOLATION CHARACTERISTICS

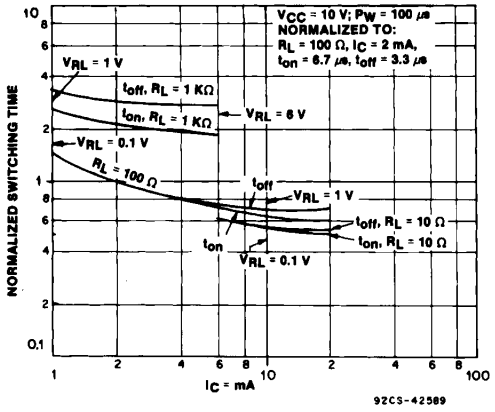
Surge isolation voltage	V_{ISO}	7500		V_{Peak}	1 Minute
Surge isolation voltage	V_{ISO}	5300		V_{RMS}	1 Minute
Isolation resistance	R_{ISO}	10^{11}		ohms	V_{I-O} = 500 VDC
Isolation capacitance	C_{ISO}		2	pF	V_{I-O} = 0, f = 1 MHz

TYPICAL CHARACTERISTICS



ST1723

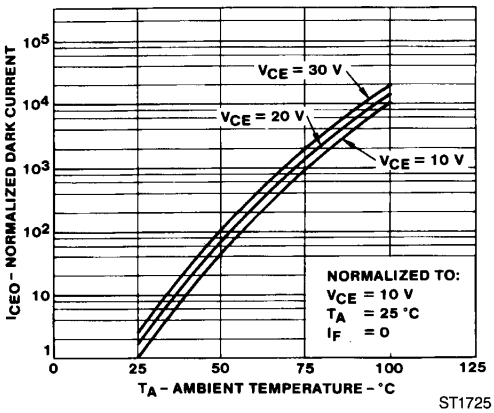
1. Input Characteristics


V_{CC} = 10 V; P_W = 100 µs
NORMALIZED TO:
R_L = 100 Ω, I_C = 2 mA,
t_{on} = 6.7 µs, t_{off} = 3.3 µs
NORMALIZED SWITCHING TIME
V_{RL} = 1 V
t_{off}, R_L = 1 KΩ
t_{on}, R_L = 1 KΩ
V_{RL} = 6 V
V_{RL} = 0.1 V
R_L = 100 Ω
t_{off}
V_{RL} = 1 V
t_{off}, R_L = 10 Ω
t_{on}
t_{on}, R_L = 10 Ω
V_{RL} = 0.1 V
I_C = mA
92CS-42589

SWITCHING SPEED VS. COLLECTOR CURRENT (NOT SATURATED)

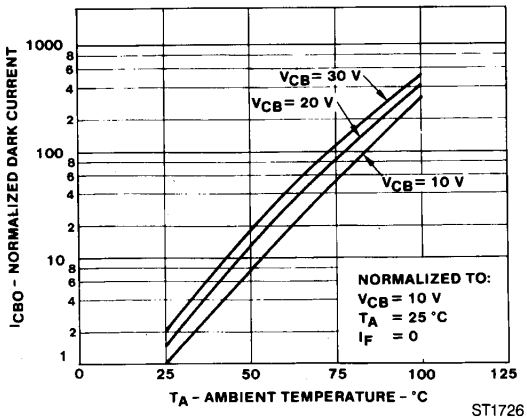
ST1724

2. Switching Speed vs. Collector Current (Not Saturated)



ST1725

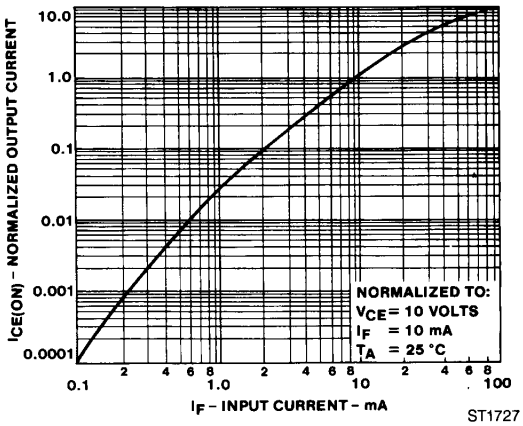
3. Dark I_{CEO} Current vs. Temperature



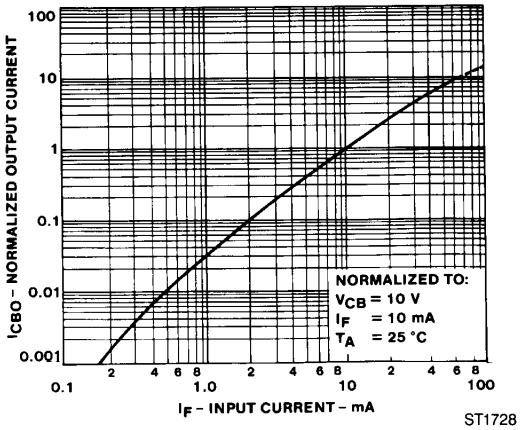
ST1726

4. I_{CBO} vs. Temperature

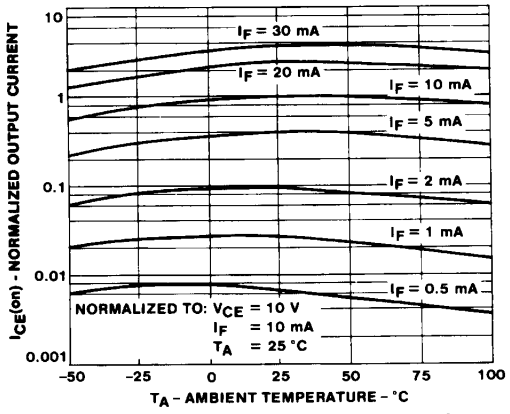
TYPICAL CHARACTERISTICS



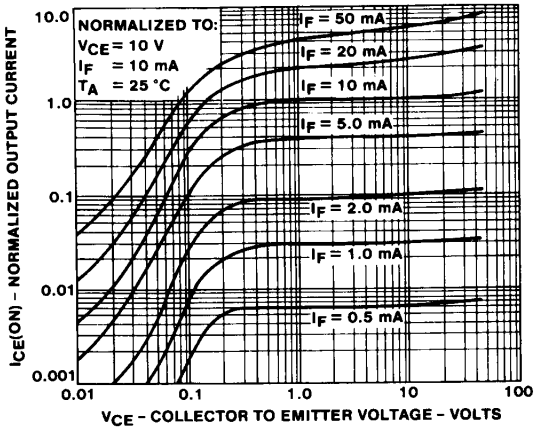
5. Output Current vs. Input Current



6. Output Current — Collector To Base vs. Input Current



7. Output Current vs. Temperature



8. Output Characteristics

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

© 2000 Fairchild Semiconductor Corporation